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Original research article

Efficacy of various surgical techniques for controlling bleeding from placental bed in cases of placenta previa

[1]Dr. P Padmaja, [2]Dr. S Madhu Chander

[1,2]Associate Professor, Department of Obstetrics and Gynaecology, Narayana Medical College, Nellore, Andhra Pradesh, India

Corresponding Author:
Dr. S. Madhu Chander

Abstract

Introduction: Placenta previa is one of the leading causes of severe postpartum hemorrhage. When coinciding with placenta accreta, it may be associated with life-threatening maternal hemorrhage after removal of the placenta due to its incomplete separation and massive bleeding from the placental attachment site. To study the efficacy of conservative surgical techniques like Cho square compression sutures and Stepwise uterine devascularization in controlling the bleeding from placental bed in cases of placenta previa.

Material and Methods: This is a Prospective and Observational study carried out in the Department of Obstetrics and Gynaecology from April 2017 to March 2018 at Narayana Medical College, Nellore. 100 pregnant women who were diagnosed to have placenta previa were taken into the study. Placenta previa diagnosed on USG undergoing abdominal delivery and who had placental bed bleed during surgery, irrespective of their gestational age and parity were included. Abruptio placenta and medical co-morbidities like pre-eclampsia, coagulation disorders were excluded. Estimated blood loss was assessed roughly by weighing of laparotomy pads before and after soiling and amount in suction apparatus. In all cases, foetal outcome was observed in form of maturity, birth weight and perinatal morbidity and mortality.

Results: The mean age of women with PP in the present study is 26±2.7 years. The highest incidence of placenta previa is in the age group of 25-29 years i.e. 51 cases (51%) while the least incidence was in the age group of 35-39 years i.e. 0 cases. Incidences in the age groups 20-24 years and 30-34 years are 38 cases (38%) and 11 cases (11%) respectively. The most common presentation of women with placenta previa is antepartum haemorrhage. 52 women (52%) presented with bleeding per vaginum at the time of admission and 48(48%) presented with no complaints of bleeding per vaginum. Though placenta previa is more commonly seen in multigravidas, it is not so uncommon in primigravidas, with 11% of primigravidas in the study having placenta previa. The incidence of placenta previa was highest in women with third pregnancy accounting to 44 cases (44%), followed by second pregnancy (36 cases).

Conclusion: In order to decrease the morbidity rate and to prevent the adverse effects of hysterectomy, conservative surgical techniques like Cho Square compression sutures and Stepwise Uterine Devascularization are effective in controlling placental bed bleed in 97% and 89% of cases and can be considered as first step measures to control postpartum haemorrhage in cases of Placenta Previa.

Keywords: Placental bed, placenta previa, placenta previa diagnosed

Introduction

Placenta previa is one of the leading causes of severe postpartum hemorrhage. When coinciding with placenta accreta, it may be associated with life-threatening maternal hemorrhage after removal of the placenta due to its incomplete separation and massive bleeding from the placental attachment site [1]. Placenta accreta occurs when the chorionic villi invade the uterine myometrium abnormally. It is divided into 3 grades based on histopathology: placenta accreta (where the chorionic villi are in contact with the myometrium), placenta increta (where the chorionic villi invade the myometrium), and placenta percreta (where the chorionic villi penetrate the uterine serosa) [2].

Currently, there is dramatic increase in the incidence of placenta previa and placenta increta (placenta previa increta) due to the increasing rate of cesarean delivery combined with increasing maternal age. With the implementation of the 2-child policy in China, the phenomenon is especially apparent [3].

Acute torrential bleeding, massive blood transfusion, hysterectomy and even the death of the woman can occur during cesarean delivery because of placenta previa increta [4]. One of the major reasons is that the bleeding from the placental attachment site in the lower uterine segment is often vast and difficult to stop after removal of the placenta [5]. Current clinical hemostatic techniques include uterine tamponade, superposition sutures, hemostatic multiple square suturing and so on when the bleeding is not

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so severe [6]. If necessary, obstetricians often attempt to employ B-Lynch sutures, pelvic artery ligation, or pelvic arterial embolization [7].

However, in practice, we have found that these conservative methods sometimes are incapable of stopping the bleeding from the placental attachment site [8]. Moreover, the success of some surgical techniques, such as blood vessel ligation, has been associated with the experience and proficiency of the obstetricians and in many hospitals, the conditions do not exist for performing perioperative temporary balloon occlusion of the internal iliac arteries and uterine arterial embolization [9]. If these procedures prove invalid, hysterectomy is performed to ensure maternal survival [10]. Therefore, how to improve surgical skills and control bleeding in a timely and effectively manner before it is beyond control has great significance in the decreasing of complications related to massive bleeding. It is essential to have an easy, effective, economical, conservative method to control bleeding during cesarean delivery for placenta previa increta.

Keeping this point in mind, the present study was designed to know the efficacy of conservative surgical techniques like Cho Square compression sutures and Stepwise uterine devascularization in controlling the placental bed bleeding in cases of placenta previa. The present study was conducted on 100 pregnant mothers who were diagnosed to have placenta previa admitted to a tertiary care centre over a period of two years.

Aim

To study the efficacy of conservative surgical techniques like Cho square compression sutures and Stepwise uterine devascularization in controlling the bleeding from placental bed in cases of placenta previa.

Material and Methods

This is a Prospective Observational study carried out in the Department of Obstetrics and Gynaecology from April 2017 to March 2018 at Narayana Medical college, Nellore. 100 pregnant women who were diagnosed to have placenta previa were taken into the study.

Written informed consent was taken from all women recruited into the study after explaining the nature of study. Details were entered in a pre-designed proforma regarding the detailed history of period of gestation, high risk factors like previous uterine manipulations and surgeries, complaints like bleeding per vaginum, past history, complications during present and past pregnancy. Investigations like Haemoglobin %, Total white blood cell count, Platelet count, Renal function tests, Blood Grouping and Typing, HIV and HbsAg status, Ultrasonography were done in all women. Additional investigations like Placental Colour Doppler was done for all major degree PP and MRI was done in selected cases where disparity was noted between USG and placental Doppler.

Maternal outcome regarding GA at delivery, mode of delivery, type of anaesthesia used, complications occurring during delivery, intraoperative surgical interventions like Cho Square compression sutures and Stepwise uterine devascularization done to control placental bed bleed and postoperative complications were observed. Estimated blood loss was assessed roughly by weighing of laparotomy pads before and after soiling and amount in suction apparatus. In all cases, foetal outcome was observed in form of maturity, birth weight and perinatal morbidity and mortality.

Inclusion criteria

Placenta previa diagnosed on USG undergoing abdominal delivery and who had placental bed bleed during surgery, irrespective of their gestational age and parity.

Exclusion criteria

- Abruptio placenta and medical co-morbidities like pre-eclampsia, coagulation disorders.

Statistical analysis

The values of epidemiological factors are presented as mean ± standard deviation. The statistical tool applied was by using the Open Epi, Version 3. Qualitative and quantitative data was analysed by chi-square and ANOVA respectively. The results were considered statistically significant when the probability of the null hypothesis was less than at least 5% ($p<0.05$).

Results

Table 1: Age Distribution of Mothers with Placenta Previa

Age in years	No of mothers	Percentage
20-24	38	38%
25-29	51	51%
30-34	11	11%
35-39	0	0%
Total	100	100%

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The mean age of women with PP in the present study is 26±2.7 years. The highest incidence of placenta previa is in the age group of 25-29 years i.e. 51 cases (51%) while the least incidence was in the age group of 35-39 years i.e. 0 cases. Incidences in the age groups 20-24 years and 30-34 years are 38 cases (38%) and 11 cases (11%) respectively.

Table 2: Distribution According to Bleeding Per Vaginum at Admission

Bleeding per vaginum	No. of women	Percentage
Present	52	52%
Absent	48	48%
Total	100	100%

The most common presentation of women with placenta previa is antepartum haemorrhage. 52 women (52%) presented with bleeding per vaginum at the time of admission and 48(48%) presented with no complaints of bleeding per vaginum.

Table 3: Distribution According to Number of Pregnancies

Gravida	No. of women	Percentage
G1	11	11%
G2	36	36%
G3	44	44%
G4	7	7%
G5	2	2%
Total	100	100%

Though placenta previa is more commonly seen in multigravidas, it is not so uncommon in primigravidas, with 11% of primigravidas in the study having placenta previa. The incidence of placenta previa was highest in women with third pregnancy accounting to 44 cases (44%), followed by second pregnancy (36 cases). Among 44 cases with third pregnancy, 20 cases (46 %) had 1prior LSCS and 14 cases (32 %) had 2 prior LSCS.

Table 4: Intraoperative Interventions Done to Control Placental Bed Bleed

	Intra operative interventions	Bleeding controlled	Not controlled	Total	
Without placental adherence (n=82)	Cho Square compression sutures	49 100%	0 0%	49 60%	**p value=0.01***
	Stepwise Uterine Devascularization (SUD)	30 91%	3 9%	33 40%	
With	Cho Square	12	2	14	
adherent	compression sutures	86%	14%	78%	
placenta	SUD	3	1	4	**p value=0.3**
(n=18)		75%	25%	22%	
	Total	94	6	100	

In cases of PP without adherence, Cho Square compression sutures effectively controlled placental bed bleed in 49 cases (100% success) whereas SUD had 91% (30 cases out of 33) success rate in controlling bed bleed,9% underwent hysterectomy. Here p value is <0.05, so the relation is statistically significant between the two surgical procedures.

In cases of PA, Cho Square compression sutures effectively controlled placental bed bleed in 86% cases (12 cases out of 14) whereas SUD had 75% (3 cases out of 4) success rate in controlling bed bleed, 14% and 25% of cases underwent hysterectomy respectively. Here p value is >0.05, so the relation is statistically not significant.

Table 5: Intraoperative Blood Loss

Blood loss (in ml)	No. of women	Percentage
500-1000	14	14%
1000-1500	36	36%
1500-2000	25	25%
>=2000	25	25%
Total	100	100%

Mean intraoperative blood loss was 1.4±0.55 litres. 14% of the cases had a blood loss between 500ml to 1000ml. In 36% of the cases, it was 1000ml to 1500ml. And, in 25% of the cases, it was 1500 ml to 2000 ml. Massive transfusion of blood and blood products was needed in 3% of the cases.

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Discussion

Placenta previa is one of the leading causes of obstetric haemorrhage leading to increased maternal morbidity and mortality. The present study with 100 women was undertaken at Gandhi Hospital in order to study the efficacy of surgical techniques like Cho Square compression sutures and Stepwise Uterine Devascularization in controlling the placental bed bleed. This study was a prospective observational study.

The mean age of women with placenta previa was found to be 26±2.7 years in the present study while that in the studies of Khashoggi T *et al*., Brenner WE *et al*. and Bhatt *et al*. were 27.6 years, 28.3 years and 30.6 years, indicating that the incidence of placenta previa becomes more common in women as the age advances and is reported in literature to be the highest in women aged 35 years or older (0.8% of all deliveries) and the lowest in women aged <25 years (0.07%) [10-12]. Warshak CR *et al*. reported mean age in their studies as 28.6 and 26.2 years respectively [13].

Placenta previa and accrete syndromes constitute a huge part of obstetric haemorrhage. About 14% had a blood loss between 500ml to 1000ml. The blood loss was between 1000 ml to 1500ml and 1500-2000ml in 36% and 25% of the cases respectively. Massive haemorrhage requiring multiple transfusions of blood and blood products occurred in 3% of the cases. Massive transfusion protocol was implemented and blood and blood products were transfused in 1:1 ratio. The mean blood loss in present study was 1.4±0.55 litres.

Out of 61 patients where placental bed bleed was controlled by Cho Square compression sutures, 29 patients had blood loss of <= 1.5 litres and 32 patients had blood loss of >1.5 litres.

The mean blood loss with this procedure was about 1.35±0.45 litres in the present study. Out of 33 patients where placental bed bleed is controlled by SUD, 19 patients had blood loss of <=1.5 litres and 14 patients had blood loss of >1.5litres. The average blood loss with this procedure was about 1.32±0.48 litres.

There is no statistical difference related to intraoperative blood loss between the two surgical procedures in the present study as the p value is >0.05. The mean blood loss with each procedure was comparable with studies by Maurizio Arduini *et al*. and Salah A, Abd Rabbo, *et al*. [14-16].

Conclusion

In order to decrease the morbidity rate and to prevent the adverse effects of hysterectomy, conservative surgical techniques like Cho Square compression sutures and Stepwise Uterine Devascularization are effective in controlling placental bed bleed in 97% and 89% of cases and can be considered as first step measures to control postpartum haemorrhage in cases of Placenta Previa.

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